We have over 20,000 different genes in the body. These genes are like instruction manuals for how to build a protein, and each protein has an important function that helps to keep our body working how it should. The *PCSK9* gene makes a protein called the PCSK9 protein. The PCSK9 protein helps to regulate the amount of cholesterol that is the bloodstream by controlling the number of LDL cholesterol receptors on the cells. LDL receptors attach to LDL cholesterol that is floating around in the blood and brings it into the cells. The cells can then either use, store, or get rid of the cholesterol. The number of LDL receptors that a cell has determines how quickly LDL cholesterol is removed from the bloodstream.

If there is a harmful error (called a pathogenic variant) in the *PCSK9* gene, then it may not make as much of the PCSK9 protein as the body needs. If there is not enough of the PCSK9 protein, then the liver can not clear extra cholesterol from the bloodstream as quickly. This can lead to the cholesterol building up in the body, which can cause the signs and symptoms we associate with familial hypercholesterolemia.

Pathogenic variants in the *PCSK9* gene are passed through a family in an autosomal dominant pattern, meaning that anyone who carries the variant has a 50% chance to pass it down to any children they have. Women and men both have the *PCSK9* gene and have the same chances to inherit and pass down pathogenic variants. Almost all people who have a pathogenic variant in the *PCSK9* gene have a parent who also carries it.

Genetic Testing for *PCSK9*

Genetic testing for pathogenic variants in *PCSK9* is currently available, but there are a few different ways to approach testing:

- *Single site analysis*: Testing specific to a known pathogenic variant in the family
- Full gene sequencing and rearrangement analysis: Comprehensive testing to search for all currently detectable pathogenic variants in the gene
- Gene panels: Newer, more broadly based gene tests that would include not only the *PCSK9* gene, but other genes known or suspected to be associated with familial hypercholesterolemia

Click here to learn more about scheduling a genetic counseling appointment for questions about pediatric or adult genetic conditions.